

REMARKS

This Amendment, filed in reply to the Office Action dated August 14, 2007, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested. Claims 1-30 are all the claims pending in the application. In the present Amendment, Applicant cancels claim 21-30, amends claims 1, 5, 6, 9, 10, 11, 19, 20, and adds claims 31-33. No new matter is added.

I. Claim Rejections under 35 U.S.C. § 102

Claims 1-20 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Yagi (JP Pub. No. 11-263004). Applicant respectfully submits the following arguments in traversal of the cited art rejection.

Yagi discloses a method of creating an embossed image (Yagi at Abstract). In Yagi, an image is first printed on a medium through a conventional inkjet printing method, and once printing of the image is complete, “particles, such as a toner, are injected with a toner flight method to a printing portion over said ink” (paragraph 0007). The ink and the particles are then melted through application of heat, yielding a three-dimensional image (*see* paragraph 0007).

The Examiner alleges that Yagi teaches a three-dimensional image forming process as recited in the present invention. The Examiner acknowledges that Yagi does not explicitly teach the step of acquiring first height information, but further alleges that such aspects of the invention are “inherent” in Yagi (Office Action at page 3).

Applicant respectfully submits that Yagi does not teach all features of the present invention. In particular, Yagi does not teach at least “forming a lamination image of said three-dimensional image having said undulations with different heights corresponding to said three-dimensional object by laminating ink solid ejected using said ink jet system on said first layer

image secured on said support based on said acquired first height information” as recited in amended claim 1.

Yagi’s method of forming a three dimensional image comprises ejecting toner particles over an image previously printed using conventional methods, and requires melting of the toner particles with the ink of the previously printed image in order to attain a relief image. Yagi does not teach “laminating ink solid ejected using said ink jet system on said first layer image secured on said support.” In particular, whereas Yagi teaches “melting” of the toner particles with the ink of the previously printed image, the present invention ejects laminating ink solid on a first layer image secured on its supporting medium.

At least for this reason, Applicant respectfully submits that amended claim 1 is not anticipated by Yagi.

Furthermore, Yagi discloses, as the Examiner asserts on page 4 of the Office Action, using gradation technology to adjust the amounts material added to the object. However, Yagi uses gradation technology to change the waveform of the drive, and the like, of the printing signal to adjustably control the amount of flying ink deposited into the surface, merely adding density gradation, i.e. tones, to the image.

Thus, Yagi merely adjusts the degree of the irregularities of the printed image according to the density gradation (tone) of the image, and does not teach “forming a lamination image of said three-dimensional image having said undulation corresponding to said three-dimensional object by laminating ink solid ejected using said ink jet system on said first layer image secured on said support based on said acquired first height information.”

For this additional reason, Applicant respectfully submits that amended claim 1 is not anticipated by Yagi.

Regarding claims 2-20, Applicant respectfully submits that they are patentable based on their dependency on amended claim 1, but also for their individually recited features. In particular, claim 3 recites that “lamination image of [the] three-dimensional image is formed using an ink jet system that is capable of laminating said ink solid by ejecting ink containing a thermoplastic solid or ultraviolet cure ink” Yagi discloses the injection of “particles of the toner or the like” over the previously printed image to form a three dimensional image. We would propose that such a general statement does not specifically disclose forming a three-dimensional image by laminating a previously printed image by ejecting ink containing “thermoplastic solid or ultraviolet cure ink” as recited in claim 3.

Furthermore, the Examiner concedes that Yagi “does not explicitly teach the aspects regarding the step of acquiring first height information,” but turns to the doctrine of inherency to allege that these aspects are

inherent in Yagi principally because Yagi teaches controlling the amount of material added to the object (during the lamination state) by using generally known “gradation technology”, which involves adjusting the degree of irregularities (e.g., surface features of the object, due to height differences or undulations) in the object and adjusting the amount of material added to the object (Office Action at page 3 (quotes in the original)).

Under the doctrine of “inherency,” if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element “is necessarily present in the thing described in the reference” *Cont’l Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991). “Inherent anticipation requires that the missing descriptive material is ‘necessarily present,’ not merely probably or possibly present, in the prior art.” (emphasis added) *Trintec Indus., Inc. v. Top-*

U.S.A. Corp., 295 F.3d 1292, 1295, 63 U.S.P.Q.2d 1597, 1599 (Fed. Cir. 2002); see also MPEP § 2112.

It appears to be the Examiner's contention that, because Yagi adjusts the degree of irregularities in the three dimensional image and adjusts the amount of material added to the image, it is inherent that Yagi's method comprises a step of acquiring first height information. Applicant respectfully submits, however, that the present invention, in addition of disclosing acquiring first height information, discloses a variety of methods of acquiring such first height information, and that such methods are not inherent in Yagi.

For example, amended claim 9 recites "calculating said first height information ... from the inputted two-dimensional image information." As further example, amended claim 11 recites

acquiring said first height information comprises the steps of:
acquiring second height information concerning a height or heights
of said three-dimensional object from inputted three-dimensional
object information, and converting the acquired second height
information based on human's visual characteristics into desired
height information with which said undulations with the different
heights corresponding to said three-dimensional object are
reproducible on said support.

Applicant respectfully submits that, at least these methods of acquiring first height information are not taught by Yagi, and are not inherent in Yagi under the doctrine of "inherency."

II. Claim Rejections - 35 USC § 103

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Yagi in view of Zhang *et al* (U.S. Patent Application Publication 2002/0113331 A1; hereinafter "Zhang"). Applicant respectfully submits the following arguments in traversal of the cited art rejections.

As an initial matter, we would direct the Examiner to the fact that Zhang requires very specific forms on material during its process. This requires materials of sufficient fluidity and certain melting points and cross-linking properties (Zhang at paragraphs 0008-0009). Zhang suggests that materials not having such properties cannot be reliably bonded and stacked together without distortion. In complete contrast, Yagi provides a system that is completely independent of the type of material being used (see, e.g., Yagi at paragraph 0006). Based on the teachings of Zhang, one skilled in the art would not apply any height determination techniques into Yagi, which would include materials with poor stacking abilities and significant distortion. Therefore, one skilled in the art would not combine teachings of Yagi and Zhang.

The Examiner alleges that Yagi teaches a three-dimensional image forming process as set forth in the instant claims, except the Examiner concedes that Yagi fails to disclose the aspects regarding the step of acquiring first height information object. The Examiner alleges that Zhang cures Yagi's deficiency. *See* Office Action, pages 3-4. However, Zhang does not teach height acquisition prior to starting of forming said lamination image.

Zhang discloses a method of fabricating a three-dimensional object. In particular, Zhang discloses the use of a sensor means to periodically measure the dimensions of the three-dimensional object being created, and "use the acquired data to help in the determination of where each new logical layer of the [object being created] should be, and possibly what the curvature and thickness of each new layer should be." Zhang, paragraph [0073].

We have already demonstrated that Yagi does not meet all the requirements of independent amended claim 1, including elements other than the step of acquiring first height information. We would further submit that Zhang fails to correct Yagi's deficiencies.

The Examiner alleges that paragraph [0073] discloses the step of acquiring first height information of the present invention when disclosing the use of “sensor means to periodically measure the dimensions of the object (such dimensions include height information and undulations) and to use the data during object manufacturing by a three-dimensional image forming process.” See Office Action, page 4.

However, the portion cited by the Examiner relates to obtaining information from the object being created, in particular, for adapting subsequent steps in the formation process to obtain a more accurate three-dimensional object. See Zhang, paragraph [0073]. Zhang, alone or in combination with Yagi, does not teach or suggest at least the step of acquiring first height information by calculating said first height information from the inputted two-dimensional image information, as recited in amended claim 9.

Furthermore, with respect to amended claim 11, Zhang, alone or in combination with Yagi, does not teach or suggest at least the step of

acquiring said first height information compris[ing] the steps of: acquiring second height information concerning a height or heights of said three-dimensional object from inputted three-dimensional object information, and converting the acquired second height information based on human's visual characteristics into desired height information with which said undulations with the different heights corresponding to said three-dimensional object are reproducible on said support.

III. Amended Claims

Applicant amends claims 1, 5, 6, 9, 10, 11, 19 and 20 to further define the scope of the invention.

IV. New Claims

Applicant adds claims 31-33 to describe features of the invention more particularly.

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

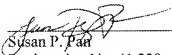
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